

**REMARKS:**

The Office Action dated January 22, 2010 ("the Office Action"), has been received and carefully reviewed. The preceding amendments and the following remarks form a full and complete response thereto. Claims 1, 2, 5, and 9 are hereby amended. Support for the amendments to claims 1, 5, and 9, which merely clarify the natural size of the garment parts that is obtained by the invention as recited in the original claims and do not narrow the original claim scope, may be found, inter alia, at paragraphs [0007]-[0009], [0013], [0015], [0038], [0041], [0042], [0046], and [0049] of Applicants' specification, as well as in FIGS. 9-12 and 18. Claim 2 is amended to address matters of form only. No new matter is added by these amendments.

**Examiner Interview**

Applicants appreciate the courtesy extended Applicants' representatives during the interview with Examiner Craig on April 15, 2010.

**Rejections under Non-Statutory Obviousness-Type Double Patenting**

Claims 1-12 were rejected under the judicial doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Pat. No. 7,379,786, commonly owned with this application, in view of U.S. Pat. No. 5,754,431 to Kotaki ("Kotaki"). In order to overcome this rejection, Applicants previously filed a terminal disclaimer, which was not accepted by the Office due to apparent formality concerns. Applicants subsequently filed a corrected terminal disclaimer on January 20, 2010. During the interview conducted on April 15, 2010, Examiner Craig acknowledged that the corrected terminal disclaimer had been received and accepted by the Office. Applicants appreciate this acknowledgement and respectfully request that this rejection be withdrawn.

**Rejections under 35 U.S.C. § 103**

Claims 1, 2, 4, 5, 6, 8, 9, 10, and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,968,297 to Ziakovic et al. ("Ziakovic") in view of

Kotaki. Applicants respectfully traverse the rejection and submit that claims 1, 2, 4, 5, 6, 8, 9, 10, and 12 recite subject matter that is neither disclosed nor suggested by this combination of references.

Independent claims 1, 5, and 9 respectively recite a method, a device, and a computer program product for simulating wearing of a knit garment on a human model. Among other features, these claims each recite a feature related to shrinking/expanding parts of the garment toward axes matched with those parts such that for each of the tubular parts, at least one of (a) a portion of the tubular part contacts with the human model, and (b) a number of stitches per length of the tubular part reaches a predetermined value. This claimed process is described in Applicants' specification, inter alia, at paragraphs [0038] and [0046], which are reproduced below (emphasis added):

[0038] A stitch motion unit 58 moves each stitch toward a polygon obtained by the collision polygon judgment unit 57 so as to obtain a position at which each stitch collides with a polygon and rebounds slightly in the original direction or a state in which a stitch is placed outside a polygon and the garment is virtually applied to the human model. The garment has its natural size which is determined according to the number of stitches and the size of each stitch, and the garment which is expanded by stretching the peripheral length should shrink until the peripheral length becomes its natural size. Therefore, a stitch is moved while monitoring the number of stitches per length and the like, shrinking of the garment is stopped when the stitch collides with a polygon, and the shrinking is stopped when the number of stitches per length in the course direction reaches a predetermined value, even when the stitch does not collide with a polygon.

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[0046] A process of temporarily wearing the garment to the human model is explained using FIG. 7 through FIG. 12. As shown in FIG. 8, the human model has at least three axes of a torso b, right arm ra, and left arm la. Although these axes are straight line, they may be curved. An intersection of these three axes corresponds to a neck 100, and a lower part thereof corresponds to a shoulder 102. 104 in FIG. 9 is a torso surface when viewed horizontally, which is constituted actually from a number of polygons. A body 106 which is expanded by means of solid expansion is in

the form of an elliptic cylinder and arranged so as to encompass the torso surface 104. The body 106 is temporarily arranged in a position substantially proper with respect to the torso by means of the tentative positioning unit 56. Each stitch of the body 106 is caused to shrink toward the axis b of the torso and collides with a polygon, and the shrinking is stopped when the stitch collides with a polygon or once the number of stitches per length reaches a predetermined value. When a part of a stitch of the course is supposedly positioned on an inner side of the polygon due to the unevenness of the torso surface, the stitch moves away from the axis to come outside of the polygon, and, when the number of stitches per length reaches a predetermined value, expansion of the stitch stops.

Thus, the present invention provides an improved method for realistically displaying knit garments worn by a human model that is at least less computationally complex than prior methods.

Independent claims 1, 5, and 9, are patentable over the combination of Ziakovic and Kotaki at least because neither of these references discloses or suggests all of the features recited in claims 1, 5, and 9. For example, neither Ziakovic nor Kotaki discloses or suggests the claimed features related to shrinking/expanding the knit garment toward matched axes so that a portion the garment contacts the human model or a number of stitches per length reaches a predetermined value.

Independent claims 1, 5, and 9, are patentable over the combination of Ziakovic and Kotaki at least because neither of these references discloses or suggests all of the features recited in claims 1, 5, and 9. For example, neither Ziakovic nor Kotaki discloses or suggests the claimed features related to shrinking/expanding the knit garment toward matched axes so that a portion the garment contacts the human model or a number of stitches per length reaches a predetermined value. The Office Action appears to argue that this feature is disclosed generally by the process of relaxation described at columns 9 through 14 of Ziakovic. Office Action at page 7. Applicants respectfully disagree. Ziakovic describes a three-dimensional displacement of triangles, based upon traction forces acting on the garment as well as a potential field constructed around the dummy. Ziakovic does not disclose that, during any portion of the relaxation process, the pieces of the garment are constrained to shrink or expand along a single

dimension toward a corresponding axis of the model until a portion the piece contacts the model or a number of stitches per length reaches a predetermined value.

Kotaki, which is arguably directed to another method for simulating a knitted garment, fails to remedy the deficiencies of Ziakovic. For example, Kotaki at least fails to disclose or suggest the claimed feature related to shrinking/expanding the knit garment toward matched axes so that a portion the garment contacts the human model or a number of stitches per length reaches a predetermined value.

The independent claims 1, 5, and 9 are patentable over the combination of Ziakovic and Kotaki at least because this combination fails to disclose shrinking/expanding the temporarily positioned knit garment toward the axis matched with each of the tubular parts of the knit garment in a peripheral direction. Additionally, the dependent claims 2, 4, 6, 8, 10, and 12 depend from claims 1, 5, and 9 and incorporate all of the limitations recited in the independent claims and not disclosed or suggested by Ziakovic or Kotaki. Therefore, these dependent claims are also patentable over this combination of references for at least this reason, in addition to the novel features recited by these claims individually. In light of the above arguments, Applicants respectfully request that this rejection under 35 U.S.C. § 103(a) be withdrawn.

Claims 3 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ziakovic in view of Kotaki. Applicants respectfully traverse the rejection and submit that claims 3 and 7 recite subject matter that is neither disclosed nor suggested by this combination of references. For example, as discussed above, neither Ziakovic nor Kotaki discloses or suggests the features of claims 1 and 5 that relate to shrinking/expanding the knit garment toward the matched axes so that for each of the tubular parts, at least one of (a) a portion of the tubular part contacts said human model, and (b) a number of stitches per length of the tubular part reaches a predetermined value. Claims 3 and 7 depend from claims 1 and 5, respectively, and incorporate all of the limitations recited in the respective independent claims, including those not disclosed or suggested by this combination of references. Claims 3 and 7 are

patentable over Ziakovic and Kotaki for at least this reason, in addition to the novel features that these claims recite individually.

Furthermore, at page 9, the Office Action takes Official Notice that “having a stitch on a virtual or actual garment be arranged or re-arranged along the course of whale [sic] direction is well known in the garment art.” This notice is allegedly supported by U.S. Pat. No. 4,306,429 to Warsop. Applicants respectfully disagree.

Wasop discloses a “stitch bonded fleece fabric” including, among other features, a “back bar structure . . . [that] extends over at least two adjacent wales of the front bar structure.” Wasop at col. 3, ll. 42-44. Wasop may arguably support a proposition that “courses” and “wales,” as structural components of knit garments, are well known in the garment art. Indeed, knitting artisans have understood the terminology of courses and wales for many years, if not for centuries. However, Applicants have not merely claimed courses and wales; Applicants’ claims recite rearranging each stitch of the garment along a course direction and a wale direction in order to remove distortions. This rearrangement of stitches and removal of distortions is described, inter alia, at paragraphs [0030] and [0051]-[0052] of Applicants’ specification, reproduced below:

[0030] Distortions are generated on the garment due to wearing. For example, at the connection between the sleeve and body, the body moves toward the axis of the torso and the sleeve moves toward an axis of an arm, thus a large distance is generated between adjacent stitches (knitted stitch). Therefore, an approximate correction unit 28 roughly corrects the stitch arrangement in two directions of a horizontal direction (course direction) and a vertical direction (wale direction). For example, in the correction in the horizontal direction, the approximate correction is performed so that stitches are arranged evenly in the course direction or each stitch is arranged at a midpoint between stitches on both sides in the course direction. Since wale directions are no longer linear due to concave and convex units of a surface of the human body and connections between the body and sleeves, the approximate correction in the vertical is performed on a deviation of a wale direction from a vertical line. For example, suppose that the position of each stitch is a mean position between the front and back wales at the same wale. In the vertical and horizontal approximate corrections, restrictions are applied in a range of movement so that the stitches do not collide with the polygons.

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[0051] In FIG. 15, 152 is a body which is subjected to the approximate correction in the horizontal direction, and 154 and 155 are sleeves which are subjected to the correction in the horizontal direction. In the approximate correction in the horizontal direction, stitches are rearranged along each course of the sleeves and body, wherein, for example, the stitches are arranged at regular intervals, or each stitch is rearranged so that the space between both right and left stitches is constant. According to these rules, each stitch is moved in the course direction. As a result, the stitch moves in the course direction so that the stitches of the body embeds the units of the split lines 136 and 137 shown in FIG. 12, and a gap generated between the sleeve and body is embedded.

[0052] The arrangement of the wale of the boundaries between the sleeves and the body in FIG. 15 is unnatural. In addition, since various concave and convex units are formed on the human model, the approximate correction is performed along the wale direction (vertical direction). 162 in FIG. 16 is a body after subjected to the approximate correction in the horizontal direction, and 164 and 165 are sleeves after subjected to the approximate correction in the vertical direction. For each wale of each part, a model is used in which a stitch attempts to approach the middle of two top and bottom stitches with respect to a vertical direction and a direction within a horizontal plane perpendicular to this vertical direction, the approximate correction is added in a vertical direction. At this moment, when the stitch collides with a polygon during the process of correction, rules are added such as changing the destination to a position where the stitch does not collide or the stitch cannot be moved. These rules apply in the approximate correction in a horizontal direction. 168 in FIG. 16 indicates the approximate correction in the vertical direction for one wale, and indicates one wale of the body in the vicinity of the connection between the sleeve and the body. The approximate correction is added in the vertical direction in this manner. The approximate correction is performed once in each of the horizontal and vertical direction in this embodiment, but the approximate correction is repeated a plurality of times according to need to remove the distortions generated due to wearing of the garment.

Warsop appears to be directed to the construction of a physical fabric, and does not address any concerns of simulating a knit garment, such as rearranging stitches (in course and wale directions, or any other directions) to remove distortions. While Ziakovic may cursorily mention a “mechanical simulation” step, Ziakovic fails to disclose or describe any details of this step. For example, Ziakovic does not discuss, mention, or even suggest rearranging the stitches of the garment in a course direction and a wale

direction. One having ordinary skill in the art, in view of the limited disclosures of Ziakovic and Kotaki, and even in view of Warsop (i.e., having mere knowledge of courses and wales), would not have found it obvious to rearrange each stitch along a course direction and a wale direction as described in Applicants' specification and as recited in claims 3 and 7.

The dependent claims 3 and 7 are patentable over the combination of Ziakovic and Kotaki at least because this combination fails to disclose shrinking/expanding the temporarily positioned knit garment toward the axis matched with each of the tubular parts of the knit garment in a peripheral direction and also fails to disclose rearranging each stitch of the garment along a course direction and a wale direction to remove distortions. In light of the above arguments, Applicants respectfully request that this rejection under 35 U.S.C. § 103(a) be withdrawn.

#### Rejections under 35 U.S.C. § 112

Claims 3 and 7 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claims the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection and submit that a person having ordinary skill in the art, reading the claims in light of the specification, would have a clear understanding of the metes and bounds of the claim.

The Office Action appears to object to the term "distortions" as it is used in claims 3 and 7. As was discussed during the interview of April 15, 2010, and restated above, the specification consistently describes the recited distortions (i.e., distortions that result from different tubular portions of the garment shrinking/expanding vis-à-vis different axes of the model), and the claimed process for removing those distortions, at, inter alia, paragraphs [0030] and [0051]-[0052], which are reproduced above. Because one having ordinary skill in the art would readily be able to determine, at least based on the disclosure and description in Applicants' specification, the scope of claims 3 and 7, Applicants respectfully request that this rejection under 35 U.S.C. § 112, second paragraph, be withdrawn.

In view of the above, all objections and rejections have been sufficiently addressed, and reconsideration is requested. The Applicants submit that the application is now in condition for allowance and request that all pending claims be allowed and this application passed to issue.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02 2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,

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